REMARKS/ARGUMENTS

The claims are 2-21. Claims 19 and 21 have been amended to better define the invention. Claim 18 has been amended to correct a clerical error. Applicant also herewith submits a Terminal Disclaimer and a Declaration under Rule 132. Reconsideration is expressly requested.

Claim 18 was objected to because of the use of the phrase "The process Use" which resulted from a clerical error. In response, Applicant has amended claim 18 to delete the word "Use" from the preamble as suggested by the Examiner. Accordingly, it is respectfully requested that the Examiner's objection to claim 18 be withdrawn.

Claims 2, 3, and 6-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Rosenberg et al. U.S. Patent No. 6,046,297* in view of *Sondhe et al. U.S. Patent No. 5,340,652.* The remaining claims 4-5 and 21 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Rosenberg et al.* and *Sondhe et al.* and further in view of *Motsinger et al. U.S. Patent No. 3,217,536.*

Essentially the Examiner's position was that *Rosenberg et al.* discloses the process recited in the claims, except for bringing the mixture into contact with a synthetic resin that is not cured or not completely cured, that *Sondhe et al.* discloses this feature, and that it would have been obvious to one of ordinary skill in the art to combine the composition of *Rosenberg et al.* with the process of *Sondhe et al.*, motivated to do so for such desirable properties as longer pour life, reduced tendency to crack, and reduced presence of toxic free toluene diisocyanate monomers, as evidenced by *Rosenberg et al.* *Motsinger et al.* was cited with respect to claims 4-5 and 21 as disclosing a fiberglass laminated epoxy material on a wind vane.

This rejection is respectfully traversed.

As set forth in claim 19 as amended, Applicant's invention provides a process for the production of synthetic resin composite materials with polyurethane gel coats. The process includes the steps of mixing a polyol component A) and a polyisocyanate component B). The polyol component A) contains one or several polyols and one or several aromatic amines and has a hydroxyl group concentration of 0.5 to 10 mol hydroxyl groups

per kg of polyol component. The polyisocyanate component B) contains one or several aromatic polyisocyanates.

The mixture is at least partially cured to form a gel coat material. The gel coat material is brought into contact with synthetic resin. The synthetic resin includes epoxy resin and/or vinyl ester resin and is not, or not completely, cured at the time when it is brought into contact with the gel coat material.

In this manner, Applicant's process produces a component for a polyurethane-based gel coat resin system which provides a comparatively long lamination time with a pot life sufficient for mixing and for introduction into the mold, comparatively short gel and tack-free times that are nevertheless sufficient for film formation, good adhesion between gel coat and synthetic resin, a gel coat which displays adequate elongation at break and has no tendency to crazing, and creates a smooth component surface that is free from sink marks, and which is easily processable and inexpensive.

None of the references cited by the Examiner, whether alone or in combination, discloses or suggests a process for the

production of synthetic resin composite materials with polyurethane gel coats as recited in Applicant's claim 19 as amended.

Claim 19 as amended recites that a polyol component A) and a polyisocyanate component B) are mixed and the mixture is at least partially cured to form a gel coat material. The polyol component A) is specified as containing one or several polyols and one or several aromatic amines. It is respectfully submitted that *Rosenberg et al.* fails to disclose or suggest mixing one or several aromatic amines with one or several polyols before mixing those one or several polyols with one or several aromatic polyisocyanates. Rather, *Rosenberg et al.* discloses that first polyisocyanate is mixed with polyols, next all or substantially all of the free polyisocyanate is removed from the mixture (see claim 1, step (b)), and only thereafter are aromatic amines added to the mixture of polyol and polyisocyanate. All three claims of *Rosenberg et al.* include explicitly or implicitly the order of the introduction of aromatic amines to polyols that have already been mixed with and that have already reacted with polyisocyanates. *Rosenberg et al.* additionally discloses that the aromatic amine should not be pre-mixed with polyol before

being added to the polyol/polyisocyanate mixture, because doing so significantly increases the propensity of the final mixture to crack and reduces the pot life of the final mixture. See column 3, lines 18-20 and column 11, lines 3-10 of *Rosenberg et al.*

It is respectfully submitted that one of ordinary skill in the art understands that altering the order of introduction of various reactants to a chemical reaction alters the final product of the chemical reaction. If a component A forms bonds with component B before component C is added, then different functional groups will be available to bond with component C than would be available if component C were introduced simultaneously with component B to component A.

This fundamental concept of chemistry of the significance of the order of introduction of the reactants is highlighted in the process disclosed in *Rosenberg et al.* In *Rosenberg et al.*, aromatic amine is intended to be reacted only with a polyurethane that has been produced by mixing polyol and polyisocyanate to chemically bond the polyol to the polyisocyanate. Polyisocyanate is added in molar excess in comparison to the polyol, so that all of the polyol will react with polyisocyanate. See step (a) of

claim 1 of *Rosenberg et al.* All or substantially all of the free polyisocyanate is thereafter removed from the mixture, so that the mixture contains no or substantially no free, unreacted polyisocyanate. There is also no or substantially no free, unreacted polyol because of the molar excess of polyisocyanate introduced in step (a). See step (b) of claim 1 of *Rosenberg et al.* Aromatic amine is added only thereafter. See step (c) of claim 1 of *Rosenberg et al.*

In contrast, with Applicant's process as recited in claim 19 as amended, aromatic amine is intended to react with polyol that has not yet bonded with polyisocyanate. At the time aromatic amine is mixed with polyol in Applicant's process as recited in claim 19 as amended, no polyisocyanate has been introduced to the mixture. As recited in Applicant's claim 19 as amended, polyisocyanate component B) is mixed with polyol component A), and in the polyol component A) one or several polyols and one or several aromatic amines have already mixed and reacted with each other.

The chemical reaction of *Rosenberg et al.* is different from the chemical reaction of the process recited in Applicant's claim

19, as amended, and therefore produces a product of a different type than is produced by the chemical reaction of the process recited in Applicant's invention as recited in claim 19 as amended.

Applicant's invention as recited in claim 19 as amended relates to the production of synthetic resin composite materials with gel coats. The requirements of gel coats for such composite materials are very specific and are set out at pages 1-5 of Applicant's disclosure. For example, there must be adequate **adhesion** between synthetic resin and gel coat, which in turn requires that the curing of the mixture to form a gel coat material must proceed in a very specific manner. In particular, after the initial curing of the gel coat mixture, the subsequent **lamination time** during which the mixture must be sufficiently tacky needs to be long enough so as to allow the processing and preparation of a composite with good adhesion of the synthetic resin.

Such specific properties do not need to be shown by **castable** polyurethanes, and *Rosenberg et al.* relates to the production of **castable** polyurethane compositions. See *Rosenberg et al.* at

column 1, lines 10-11. The castable polyurethanes of *Rosenberg et al.* may be used for industrial rolls such as papermill rolls, industrial wheels and industrial tires. See *Rosenberg et al.* at column 3, lines 32-34.

Castable polyurethane compositions are typically formed by being poured into a mold. Properties such as adhesion, lamination time, and tack-free time, which are important for a coating material such as the gel coat material produced in step (i) of Applicant's process as recited in claim 19 as amended, are largely irrelevant for castable polyurethanes, such as the articles produced in *Rosenberg et al*. A molded product often has no need for quality adhesion to the mold, as the product will subsequently be removed from the mold so that more material can be poured into the mold for molding. In contrast, Applicant's invention produced by the method of claim 19 as amended depends on a prolonged lamination time for the gel coat in order to achieve good adhesion to the synthetic resin of the composite material.

The defects and deficiencies of the primary reference to *Rosenberg et al.* are nowhere remedied by the secondary references to *Sondhe et al.* and *Motsinger et al.*

Sondhe et al. fails to disclose or suggest mixing an aromatic amine with polyol before the introduction of polyisocyanate to the polyol. Rather, *Sondhe et al.* discloses that aromatic amine, the epoxy hardener, is added to polyurethane. Polyurethane is a combination of polyol and polyisocyanate. Therefore, the coating of *Sondhe et al.* is chemically different from the gel coating material produced in step (i) of the process of Applicant's claim 19, as amended, and has different properties from the gel coating material produced in step (i) of the process of Applicant's claim 19, as amended, because in *Sondhe et al.* aromatic amine is added to the reaction mixture only after polyol and polyisocyanate have already reacted.

Motsinger et al. fails to disclose or suggest any mixing of aromatic amines, polyols, and polyisocyanates. *Motsinger et al.* fails to disclose or suggest the mixing of any specific chemical components to form a product.

It is also respectfully submitted that even if the process disclosed in *Rosenberg et al.* were considered to disclose step (i) of Applicant's process as recited in claim 19 as amended, which it does not, one of ordinary skill in the art would receive no hint or suggestion from *Rosenberg et al.* to attempt to use the component produced by the method of *Rosenberg et al.* as a gel coat material with a synthetic resin on a composite material. *Rosenberg et al.* is directed exclusively to the production of castable polyurethanes. Castable polyurethanes do not have need of the qualities, such as those described above, that are important for a gel coat. Therefore one of ordinary skill in the art would not be led by the disclosure of *Rosenberg et al.* to combine or to attempt to combine the composition of *Rosenberg et al.* with the epoxy resin of *Sondhe et al.*

Applicant herewith submits a Declaration under Rule 132 by Dr. Jochen Wehner, the inventor herein and a person skilled in the art of composite materials and coatings for composite materials. As detailed in his Rule 132 Declaration, Dr. Jochen Wehner explains that following the method of *Rosenberg et al.* does not produce a gel coat material as recited in Applicant's claim 19 as amended. This Rule 132 Declaration by Dr. Jochen

Wehner is factual evidence that following the method of *Rosenberg et al.* does not produce a gel coat material as recited in Applicant's claim 19 as amended,

Accordingly, Applicant respectfully submits that claim 19 as amended is patentable over the cited references, taken either singly or in combination, together with claims 2-18, which depend directly or indirectly thereon. Applicant also respectfully submits that claim 20 for a synthetic resin composite material with polyurethane gel coat, producible by the process according to claim 19, is patentable over the cited references taken either singly or in combination. Applicant also respectfully submits that claim 21 for a rotor vane for wind power plants, or a part thereof, that is a composite material according to claim 20, is also patentable over the cited references taken either singly or in combination.

Claim 4 is dependent on claim 19 and further specifies that the synthetic resin used comprises one or several reinforcing materials. Claim 5 depends on claim 4 and further specifies that glass fiber fabric, glass fiber nonwoven, carbon fiber fabric

and/or carbon fiber bonded fabric are used as reinforcing material.

In this manner, Applicant's process as recited in claims 4 and 5 produce a composite material with improved capabilities of being resistant to weathering.

None of the references cited by the Examiner, whether alone or in combination, discloses or suggests a process for the production of synthetic resin composite materials with polyurethane gel coats, wherein the synthetic resin comprises one or several reinforcing materials, as recited in Applicant's claims 4 and 5.

Rosenberg et al. and *Sondhe et al.* both fail to disclose the use of reinforcing materials with a synthetic resin. *Rosenberg et al.* fails to disclose the use of a synthetic resin. *Sondhe et al.* fails to disclose the use of any reinforcing material with the synthetic resin. *Motsinger et al.* fails to disclose any mixing of aromatic amine with a polyurethane.

It is therefore respectfully submitted that claims 4 and 5 are patentable over the cited prior art references, whether taken singly or in combination, for this additional reason.

Claim 21 has been amended to specify that the composite material is a rotor vane for wind power plants, or a part thereof. It is respectfully submitted that *Motsinger et al.* fails to disclose or suggest a rotor vane for a wind power plant. Rather, *Motsinger et al.* discloses a force vector transducer for measuring the force and direction of a body of fluid, with a fixed outer shell. Therefore, the transducer of *Motsinger et al.* will be impacted only during high wind velocities during a storm. In contrast, with Applicant's composite material that is a rotor vane for a wind power plant or a part thereof as recited in claim 21 as amended, the rotor vane will move even at slow wind velocities and is impacted by the wind in a perpendicular direction to the flow of the wind, and thus requires greater durability to withstand the greater mechanical and abrasive long term stress it will receive.

It is therefore respectfully submitted that claim 21 as amended is patentable over the cited prior art references for this additional reason.

Accordingly, it is respectfully submitted that the claims are patentable over the cited references whether considered alone or in combination.

Claims 2-3, 5, and 8-21 were provisionally rejected on the grounds of double patenting over claims 2-19 of copending, commonly-owned U.S. Patent Application No. 10/572,785. In response Applicant herewith submits a Terminal Disclaimer with respect to U.S. Patent Application No. 10/572,785, thereby obviating the double patenting rejection.

In summary, claims 18, 19, and 21 have been amended. In addition, a Terminal Disclaimer and a check in the amount of $140.00 in payment of the Terminal Disclaimer fee are enclosed. In view of the foregoing, it is respectfully requested that the claims be allowed and that this application be passed to issue.

Respectfully submitted,
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Enclosures:
Rule 132 Declaration
Terminal Disclaimer with a check in the amount of $140.00

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on October 26, 2009.

Amy Klein

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